

AHRQ's health IT

program develops and disseminates
evidence about how health IT can
**improve health care quality,
safety, and efficiency.**



Current Priorities

The Health IT Program at AHRQ provides foundational research to ensure that health IT is designed and implemented in ways that improve quality and safety, while not resulting in excessive burden on physicians and other members of the care team. Past efforts (see Appendix) focused on health IT adoption and implementation in key areas. Current research areas include: health IT usability, consumer health IT, clinical decision support, health IT safety, patient-reported outcomes, and learning health systems. For more information, visit www.HealthIT.ahrq.gov.

Usability

AHRQ's usability research focuses on how to design and implement electronic health records (EHRs) so that they are more intuitive to use and more readily support clinical workflow. Two areas of research, supported by the AHRQ projects below, are how to effectively reduce provider burden through better health IT design and how to make data within EHRs more usable for clinical decision making.

- Many physicians are overly burdened by writing notes in EHRs. To address this problem, Dr. Thomas Payne, Professor of Medicine at the University of Washington and past Board Chair of the American Medical Informatics Association, implemented and tested a new voice-generated enhanced electronic note system (VGEENS¹), which integrates voice recognition and transcription with natural language processing and links to the EHR to improve note creation efficiency and note accuracy.
- Reviewing clinical notes, which is a necessary part of making diagnostic and therapeutic decisions, is hindered by many factors including the sheer volume of electronic clinical data in the EHR, suboptimal text user interface design, and limited time to interact with patients. Dr. Genevieve Melton-Meaux at the University of Minnesota is refining computational methods to identify new information in clinical notes and then assessing a new tool to help clinicians better visualize that new information, thereby improving clinicians' efficiency, decision making, and satisfaction with documentation mechanisms in the EHR.

¹<http://depts.washington.edu/simcentr/temp/vgeen/ahrq-2.mp4>



Consumer Health IT

Increasingly, innovative computer and information systems are being developed to help people manage health concerns, monitor important indicators of their health, and communicate with their caregivers. AHRQ supports research to determine how these patient-facing technologies can best improve the quality and effectiveness of care. For example, a recent AHRQ national webinar highlighting the results of AHRQ's patient portal research described portal impacts on patient engagement and satisfaction and identified features that make it both easier and harder for patients to use patient portals, and ways to make patient portals more responsive to patient needs. In particular, webinar attendees found the following evidence useful for informing their patient portal implementations:


- A plain-language encyclopedia hyperlinked directly to unfamiliar terms (e.g., endometriosis) was used frequently by patients accessing their medical records via a portal and provided particular value and enhanced satisfaction.
- Providing tailored online video instruction for utilizing particular portal functions (e.g., how to log in to the portal and review the visit summary or medication list) can help overcome health literacy issues that prevent effective portal usage.

Clinical Decision Support

Clinical decision support (CDS) helps clinicians, patients, and others on the care team by delivering the right information at the right time so that they can make the best care decisions. We know that CDS, when inappropriately implemented for clinicians, can lead to alert fatigue, high override rates, and physician frustration. When well implemented, CDS can improve health care processes. AHRQ has a long history of investing in research about how to make CDS more effective and usable. In 2016, AHRQ embarked on an ambitious multi-component program to advance evidence into practice through CDS and to make CDS more shareable, standards-based, and publicly available. AHRQ has created CDS Connect, which is prototype infrastructure for authoring and sharing CDS. Those developing, implementing, and testing CDS will be able to use CDS Connect to share their CDS and to learn from each other's experiences. Through the Patient-Centered CDS Learning Network, AHRQ is bringing a wide spectrum of stakeholders together and is advancing the concept of patient-centered CDS. More information can be found at <http://cds.ahrq.gov>.

Health IT Safety

Research is needed in two key areas: how health IT can improve patient safety and how health IT itself can be safely used and implemented. AHRQ-funded research provides critical evidence in both areas, and the Program recently renewed a special emphasis notice reaffirming the intent to support research regarding the safety of health IT systems. For example, Dr. Jason Adelman, Chief Patient Safety Officer and Associate Chief Quality Officer at Columbia University Medical Center, is studying how often clinicians retract and reorder medications under various conditions, such as when they have multiple patient records open simultaneously and when patient photos are available at the time of order entry. Hospitals need practical research evidence to guide policy decisions when implementing EHRs, especially when those policy decisions can impact patient safety. Additionally, Dr.




Raj Ratwani from MedStar Health (MD) is utilizing a hybrid approach of expert manual review and machine learning techniques, specifically natural language processing, to rapidly analyze patient safety event data and determine which events are health IT-related. The team is also categorizing health IT-related safety events to determine which events could have been prevented by effective usability or implementation processes.

Patient-Reported Outcomes

For many chronic illnesses, major treatment goals become not only lengthening a patient's life but also maximizing the individual's ability to function normally, reducing symptom burden, and improving patient health-related quality of life. The incorporation of brief, valid patient-reported outcome (PRO) measures to assess functional outcomes, such as symptom amelioration (e.g., reduced pain), elimination of emotional distress, and optimal physical and social functioning, is essential to the provision of meaningful and quality health care for individuals. While some EHR systems are currently able to capture some structured PRO data, such information is not commonly collected and integrated at the point of care. Thus, PRO data are not routinely available for clinical care, research, and quality improvement. AHRQ recently released funding opportunities for how to collect and use PROs using health IT, as well as scale and spread existing health IT models that currently incorporate PROs. Current AHRQ-funded research in this area includes work conducted by Dr. David Flum, Associate Chief Medical Officer at the University of Washington, and his team, who are assessing healthcare practitioner perspectives and workflow needs to inform design principles for the meaningful integration of PROs into clinical practice.

Learning Health Systems

The United States has invested heavily in the widespread adoption and use of health IT. The next critical step is maximizing this investment by gathering evidence on how best to utilize health IT to generate, integrate, and synthesize disparate electronic data and evidence to support systems and processes that continuously improve patient outcomes. Health systems that effectively apply data and evidence to improve patient outcomes are called "learning health systems (LHSs)." AHRQ's health IT program explores how health IT can best support LHSs, particularly in ambulatory care settings. AHRQ issued a funding opportunity calling for exploratory and developmental research in this area.



Appendix – AHRQ Division of Health IT Past Achievements

Since 1968, AHRQ has invested in research grants and contracts awarded to over 180 institutions in 46 States and the District of Columbia, producing foundational work on many uses of IT to improve health delivery, including telemedicine, health information exchange, and e-prescribing. What follows are select examples of some of the many contributions of AHRQ's health IT work.

Telehealth

Telehealth can extend patient care by enabling clinicians to engage with patients or with other teams of clinicians remotely when they cannot meet in person. Project ECHO developed and evaluated a tele-consultation platform to provide clinical support to rural primary care physicians to help them to care for complex patients. Through Project ECHO, rural physicians were able to care for patients with Hepatitis C, achieving outcomes equal to or exceeding patients cared for at an academic medical center. The model has been expanded to provide specialty consultation to primary care teams caring for people with asthma, heart failure, chronic pain, mental health conditions, and complications of pregnancy. The VA is now implementing Project ECHO across the country to improve access to quality care.

Health Information Exchange (HIE)


HIE allows doctors, nurses, pharmacists, other health care providers, and patients to access and share a patient's medical information electronically across organizations and systems, for example between the emergency department and physician's offices. This can enable better coordination of care and increased safety. AHRQ funded the first large-scale demonstrations of HIE in the United States. The projects developed best-practices regarding all aspects of HIE, including establishing health information organization, technical considerations for implementation, and demonstrating value. These projects laid the foundation for national health information exchange efforts and informed the ONC State HIE grant program. There are currently active HIEs in many States, and the success of these HIEs is due to the lessons learned from AHRQ's investments.

E-prescribing

E-prescribing allows clinicians, pharmacies, and health plans to communicate prescription information electronically, which can make coordinated care safer and more efficient. AHRQ funded the evaluation of a statewide program that implemented an e-prescribing system that indicated whether medications were covered by insurance and found it to be cost saving. Another project developed an electronic system to create and securely transmit prescriptions for controlled substances. This research was used by HHS and the DEA to issue national e-prescribing standards for controlled substances, resulting in over one billion electronic prescriptions in 2014 and allowing e-prescribing of controlled substances in 49 States.

Clinical Decision Support (CDS)

CDS brings together patient-specific information with different treatment options in a way that allows clinicians and patients to choose the most appropriate care. AHRQ-funded demonstration projects created processes and tools for translating clinical knowledge and narrative guidelines into formats that can be used by




multiple electronic health record (EHR) systems for implementing CDS across a range of health care settings. One team implemented evidence-based guideline recommendations that address coronary artery disease, diabetes, and hypertension management; while another focused on prevention of pediatric obesity and chronic management of asthma for children. The tools, standards, and technology created by these demonstrations are being used by ONC and have become the basis for health IT standards established by ONC to make it easier to share CDS between systems.

Learning Health Systems

AHRQ's previous work in this area helped individual patients and their doctors find answers to questions by pioneering innovative ways to gather and analyze multiple sources of healthcare data for evidence about what works. The Inflammatory Bowel Disease Registry (ImproveCareNow), as part of the AHRQ-supported Enhanced Registries grant program, improved health outcomes in children with inflammatory bowel disease. The remission rate of children in the registry improved from 55 percent in 2007 to 79 percent in 2015, enabling thousands of children to attend school more regularly, actively engage in sports, and improve their overall health and well-being. Use of these data also enabled 49 percent of these children to sustain remission for at least 1 year, and 94 percent have achieved satisfactory growth. Another example, the AHRQ-supported Surgical Care and Outcomes Assessment Program (SCOAP)/CERTAIN project, produced a safety and quality checklist for the operating room, which is being implemented in all hospitals in Washington State. The sharing of surgical checklists, as well as clinical data about procedures and outcomes, among Washington hospitals involved in SCOAP has resulted in reduced complication rates, shorter stays, and fewer 30-day rehospitalizations.

Distributed Research in Primary Care

Distributed research allows information to be shared across organizations without sharing data, which improves our understanding of barriers to care delivery and ability to test solutions that improve quality of care. AHRQ pioneered a distributed research network in primary care through the DARTNet project funded in 2006. DARTNet demonstrated the feasibility of using routine clinical data collected in EHRs in diverse primary care sites for comparative effectiveness research in diabetes and depression. Although the U.S. Preventive Services Task Force (USPSTF) has recommended screening for depression in primary care for many years, few practices have implemented this recommendation. DARTNet customized screening for depression to workflow of each practice site. The customization enabled a majority of DARTNet practices to continue with depression screening even after the end of AHRQ support for that project. AHRQ's initial investment to create the DARTNet network met a critical need and led to its rapid growth independent of AHRQ. DARTNet has grown into a non-profit institute that now supports 12 research networks that offer access to approximately 12.5 million patient visits per year, 5 million patient lives, and 5 billion data points. These networks blend quality improvement, effectiveness, and translational research with a data-driven learning system. It is important to note that several networks focus on under-served patients including SAFTNet, Appalachian Research Network, and LA Net.



Creating Learning Communities

The Electronic Data Methods (EDM) Forum supported a learning network of researchers, clinicians, informatics experts, and other stakeholders. It developed new open-access resources (e.g., eGEMs journal, issue briefs, webinars, toolkits, websites) to share innovations and lessons learned, and to advance methods by supporting small-scale, rapid turnaround collaborative methods projects. The EDM Forum has also created several resources to improve governance of data and information for research and quality improvement, including a governance toolkit. Among the achievements: eGEMs, less than 3 years old, is now in PubMed Central and has over 58,000 downloads and over 100 papers; the patient-centered portable consent project led to an e-consent module, which is present in all 5 apps of Apple's ResearchKit.

Current AHRQ work builds on this extensive body of evidence to support projects that develop, evaluate, and scale health IT interventions that facilitate practice improvement and better patient outcomes.



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